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ANNEX IV

TO THE PROTOCOL ON COOPERATION IN THE FIELD OF
FOSSIL ENERGY RESEARCH AND DEVELOPMENT
BETWEEN
THE DEPARTMENT OF ENERGY OF THE UNITED STATES OF AMERICA (USDOE)
AND
THE MINISTRY OF COAL INDUSTRY
OF THE PEOPLE'S REPUBLIC OF CHINA (CMCI)
IN THE AREA OF
COAL PREPARATION AND WASTE STREAM UTILIZATION

WHEREAS, the USDOE and the CMCI signed a Protocol on Cooperation in the Field of Fossil Energy Research and Development on April 16, 1985, in Washington, D.C. (hereinafter referred to as the Protocol); and

PURSUANT to Article 5 of the Protocol, both Parties wish to enter into the following agreement: as "Annex IV" to the Protocol to conduct technical exchange and research cooperation in the area of Coal Preparation and Waste Stream Utilization based on the principle of equality, reciprocity and mutual benefit.

ARTICLE I - OBJECTIVES

1. The U.S. Department of Energy (USDOE) and the People's Republic of China Ministry of Coal Industry (CMCI) wish to initiate cooperative research and development activities in the field of Coal Preparation and Waste Stream Utilization, with the aim of achieving mutual benefits from such activities.
2. This activity under the U.S./PRC Protocol will establish joint efforts in the field of coal preparation technology, with emphasis on physical and physicochemical coal beneficiation.

ARTICLE II - SCOPE OF WORK

While the goal of the U.S. DOE's coal preparation research focuses on high-risk, long-term technologies and the goal in the PRC targets near-term improvements in conventional beneficiation, there exists considerable activity in certain areas of research (e.g., coal characterization for beneficiation and coal surface chemistry) that is common to achieving both goals. Therefore, cooperation between the two countries in the area of coal preparation has the potential to be mutually beneficial. Technology used in the PRC for utilization of low calorific content fuels will provide a useful connection with the need in the U.S. to utilize coal preparation reject materials.

Task 1. Information Exchange

The U.S. and the PRC will exchange summaries that describe the research being carried out in the areas of coal preparation by physical and physicochemical means funded by the governments of each of the respective countries. These documents are to be arranged on a project-by-project basis and will, at a minimum, provide the following:

- a. The title of the project
- b. A background statement that explains why the project is being carried out
- c. A project description (i.e., work plan or statement of work)
- d. Progress to date
- e. Approximate funding

The information provided by the U.S. shall emphasize advanced physical and physicochemical beneficiation methods.

The information provided by the PRC shall include description of the technology used in the PRC for utilization of low calorific content fuels from coal preparation plants.

In addition, capability statements are to be prepared and exchanged. These capability statements shall describe areas of strength with regard to coal preparation research, and shall list and describe all major scientific equipment available for such research. Information on government-funded projects is to be updated annually.

Task 2. Assessment of Common Practices in Physical Beneficiation

In order to ascertain the commonality of technical standards in the participating countries, it is agreed that the U.S. DOE and the CMCI will exchange samples of two typical bituminous coals. Each country will grind a representative fraction of all four coals to minus 10-mm and another representative fraction to 70-80% minus 75 microns and analyze, if possible, for the following:

Proximate analysis

Ultimate analysis

Minerals in ash

Sulfur forms

Petrographic determination of macerals (on an appropriately sized fraction of the minus 10-mm sample)

Size analysis

Surface elemental composition (nuclear magnetic resonance)

Porosity

Zeta potential

Washability (by centrifuge for the minus 75 micron sample)

Surface area

The results of these analyses, along with descriptions of procedures, techniques, and equipment used, will be exchanged and compared and discussions regarding these data, particularly discrepancies, will be held by the next visiting delegation.

ARTICLE III - MANAGEMENT AND OPERATIONS

1. Project Managers

Each Party shall designate a project manager for this Annex IV. The project managers shall plan the technical approach for accomplishing the two objectives, be responsible for programmatic and schedule aspects of this Annex, and schedule, coordinate, and co-chair joint meetings.

2. Advisors

Representatives from organizations within each Party may be invited to attend joint meetings and to serve as advisors to help plan and evaluate cooperative Coal Preparation and Waste Stream Utilization research and development in the U.S. and in the PRC. Other organizations may be invited to participate in the future if approved jointly by the project managers.

3. Visits

There may be a short term exchange of scientists and engineers in the institutions or research laboratories of either Party. The logistics, including the number of scientists and engineers to be exchanged, shall be agreed upon by the project managers.

4. Joint Seminars

Each Party may conduct joint seminars on selected topics as determined by the project managers.

5. Reports

- A. The Parties shall prepare semi-annual technical progress reports of all activities in their respective areas of responsibility for distribution to their counterpart.

- B. The Parties shall jointly prepare an annual report describing the work performed and detailing results achieved. Each Party shall have the right to disseminate the annual report without consulting the other Party.

ARTICLE IV - FINANCE

1. All cooperative activities under this Annex shall be subject to the availability of funds and personnel and to the laws and regulations of the respective countries.
2. Unless otherwise mutually agreed in writing, each Party shall bear all costs of its activities.

ARTICLE V - INFORMATION

1. All information provided to and arising under this Annex and all inventions or discoveries made or conceived under this Annex, and other international property rights issues will be treated in accordance with Annex I to the Fossil Energy Protocol.

ARTICLE VI - ENTRY INTO FORCE AND TERMINATION

1. This Annex shall enter into force upon signature by the Parties and remain in force for five (5) years or until the termination of the Protocol. This Annex may be amended or extended by mutual written agreement of the Parties.
2. At the discretion of either Party, this Annex may be terminated upon six (6) months advance notice in writing to the other Party. Any damages related to such termination shall be treated in accordance with the terms of the Fossil Energy Protocol.

Done at Beijing, on the October 13, 1987
in duplicate in the English and Chinese languages, each equally authentic.

Donald L. Bauer
For the Department of Energy of the
United States of America

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For the Ministry of Coal Industry
of the People's Republic of China